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ABSTRACTS OF TECHNICAL PAPERS PRESENTED AT THE 1965 NSA CONVENTION

DERMOCYSTIDIUM IN TRAY POPULATIONS OF OYSTERS IN DELAWARE BAY

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The incidence of *Dermocystidium* and mortalities attributable to this agent have been closely followed in experimental tray populations of oysters on the Cape Shore of Delaware Bay over the past six years.

The remnants of old stocks (1958-1960 imports) that had suffered heavy *Dermocystidium* mortalities, though maintaining a high incidence, exhibited reduced mortality in recent years. Two stocks, laboratory spawned progeny of previously selected parents, appear to have inherited some degree of resistance. They have relatively low mortalities during periods of *Dermocystidium* kill in other stocks — and incidence, at least in the 1961 year class, was still negligible as of October 1964.

The effects of proximity in the infection of newly introduced stocks have been most striking. Isolation of recent years' imports has been somewhat effective in reducing *Dermocystidium* mortalities, at least for the first year in trays.

SALINITY TOLERANCE LIMITS OF SOME SPECIES OF PELECYPODS FROM VIRGINIA

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Salinity tolerance limits have been determined experimentally for 24 species of adult pelecypods. Survival and activities such as burrowing, feeding and byssal attachment were used as criteria of adaptation. In two species larval development and nest building were also used. It was demonstrated that most pelecypods studied are more euryhaline than their natural distribution would indicate.

LARVAL DEVELOPMENT OF *RANGIA CUNEATA* AND *LYONSIA HYALINA*

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Larvae of *Rangia cuneata* and *Lyonsia hyalina* were reared from eggs in laboratory cultures. *Rangia cuneata* increased from 75 to 175 μ in length during a 7-day larval life. Height varied from 5 to 20 μ less than length and thickness 45 to 65 μ less than length. The "straight-hinge" line was 55 to 60 μ long. A round inconspicuous umbo appeared when larvae were about 120 to 130 μ long. Both anterior and posterior shoulders were rounded. Swimming larvae had a conspicuous apical flagellum. Neither eye spots nor hinge teeth were observed in larvae.

Lyonsia hyalina larvae measured from 155 to 175 μ in length and from 120 to 130 μ in height. They resembled the elongated "straight-hinge" larval stage of other pelecypods except for an indentation in the hinge line and a dark gray or black opaque appearance. The larval period was brief and larvae metamorphosed without developing an umbo in three days. Adults are functionally hermaphroditic and autofertilized eggs developed into apparently normal larvae.

ON THE STRUCTURE, MODE OF INFECTION, AND FATE OF *TYLOCEPHALUM* IN THE AMERICAN OYSTER, *CRASSOSTREA VIRGINICA*

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During a survey for zooparasites of *Crassostrea virginica* collected from West Loch, Pearl Harbor, Honolulu, Hawaii, larvae of the lecanicephaloid cestode *Tylocephalum*, among other parasites, were identified. Whole, living larvae were recovered by subjecting the oysters to digestion for

one hour at 37°C in an aqueous solution containing 1 per cent pepsin and 1 per cent HCL followed by sedimentation. The cestode larvae were resistant to digestion. Histological sections of additional infected oysters revealed encysted and unencysted *Tylocephalum* larvae in several regions of the mollusks' bodies. The largest number was found in the zone immediately beneath the epithelial lining of the stomach and intestine followed by the gill matrices. Occasional larvae were also found in Leydig tissue in the digestive gland where they were situated between the digestive diverticula, and in between the diverticular cells.

In addition to finding larvae in oyster tissues, the ciliated larva (coracidium) of *Tylocephalum* was found intimately associated with gill surfaces and in the stomach. The ciliated larva, which is the precursor of the tissue form, possesses penetration glands, a complete ciliated epithelial surface, and several types of cells comprising the parenchyma. These larvae are the infective form and enter the oyster by penetration.

When ciliated larvae shed their surface epithelia and penetrate through the oyster's alimentary wall, the majority become encapsulated by connective tissue fibers underlying the lining epithelium; however, some do succeed in infiltrating deeper. When histologically discrete, recently established larvae were found in the deeper tissues; no appreciable host cellular and connective tissue reactions occurred. However, in time, heavy aggregates of leucocytes and a thick connective tissue capsule surround each larva followed by decomposition and resorption of the parasite.

It is concluded tentatively that *Crassostrea virginica* is not the natural molluscan host of *Tylocephalum* since destruction of the latter occurs. The complete life cycle of *Tylocephalum* remains unknown.

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PERIVASCULAR LEUCOCYTOSIS AND OTHER TYPES OF CELLULAR REACTION IN *CRASSOSTREA VIRGINICA* (GMELIN) EXPERIMENTALLY INFECTED WITH THE METASTRONGYLID NEMATODE *ANGIOSTRONGYLUS CANTONENSIS* (CHEN)

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In an earlier paper (Cheng and Burton, 1965. *J. Parasitol.* 51:296) it was reported that both the American oyster, *Crassostrea virginica*, and the quahaug, *Mercenaria mercenaria*, were suitable experimental intermediate hosts of the metastrongylid nematode, *Angiostrongylus cantonensis*, the causative agent of eosinophilic meningo-encephalitis in man in parts of Asia and the Pacific Basin. In experiments designed to study the effect of the larvae of *A. cantonensis* on the experimental oyster host and to study the reaction of the oyster to this parasite, it was found that a certain number of the first-stage larvae of *A. cantonensis* will readily invade oysters by penetrating the stomach wall and will eventually develop to the third-stage which is infective to susceptible mammals.

Within the oyster's body, the nematode larvae can be distributed via blood vessels. During the intravascular phase, a characteristic histopathological syndrome, termed perivascular leucocytosis, is evident. The condition is characterized by the aggregation of large numbers of the host's leucocytes around blood vessel walls. This condition suggests the attraction of the host's leucocytes to some substance elicited by the parasite. The molecular size of the "leucocyte attracting substance (LAS)" must permit it to permeate the blood vessel wall. LAS may be in the form of the nematode's molting fluid.

The larvae of *A. cantonensis* are not encapsulated in the oyster's tissues; rather, they are motile and, as a result, cause lesions, especially in the Leydig tissue. Leucocytic response to motile larvae is apparent although destruction of the parasite does not appear to occur.

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THE FATE OF A VIRUS, *STAPHYLOCOCCUS AUREUS* PHAGE 80, INJECTED INTO THE OYSTER

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A virus, *Staphylococcus aureus* phage 80, was intracardially injected into the oyster, *Crassostrea virginica*, held at various temperatures to study (1) the fate of the virus particles in the oyster, (2) the response of the oyster to virus particles, and (3) the effect of temperature on the shellfish-virus model. The phage population within the oyster decreased with time following injection and the decline was faster at higher temperatures than at lower temperatures. Leucocytes pinocytosed only a small number of the phage particles. A significant portion of the phage lost was recovered from shell liquor, rejecta, dejecta, and the sea